LG C-21I

MODEL

SERVICE MANUAL

SECTION 1 SUMMARY KEY TO ABBREVIATIONS

A	AC	:Alternating Current
	ACC	:Automatic Color Control
	ACSS	:Automatic Channel Setting System
	ADJ	:Adjust
	A/E	:Audio Erase
	AFC	:Automatic Frequency Control
	AFT	:Automatic Fine Tuning
	AGC	:Automatic Gain Control
	A.H.SW	:Audio Head Switch
	ALC	:Automatic Level Control
	AM	:Amplitude Modulation
	AMP	:Amplifier
	ANT	:Antenna
	APC	:Automatic Phase Control
	ASS'Y	:Assembly
	AUX	:Auxiliary
B	B	:Base
	BGP	:Burst Gate Pulse
	BPF	:Bandpass Filter
	BS	:Brodcasting Satellite
	BW or B/W	:Black and White
C	C	:Capacitor, Chroma, Collector
	CAN	:Cancel
	CAP	:Capstan
	CAP.BRK	:Capstan Brake
	CAP.RVS	:Capstan Reverse
	CATV	:Cable Television
	CBA	:Circuit Board Assembly
	CCD	:Charge Coupled Device
	C.CTL	:Chro Control, Capstan Control
	CFG	:Capstan Frequency Generator
	CHROMA	:Chrominance
	CNR	:Chroma Noise Reduction
	COMB	:Combination
		Comb Filter
	COMP	:Comparator
		Composite
		Compensation
	CONV	:Converter
	C.ROT SW	:Color Rotary Switch
	CS	:Chip Select
	C.SYNC	:Composite Synchronization
	CTL DIV	:Control Divide
	CUR	:Current
	CYL	:Cylinder
D	D	:Drum, Digital, Diode, Drain
	D.ADJ	:Drum Adjust
	DC	:Direct Current
	D.CTL	:Drum Control
	DEMOD	:Demodulator
	DET	:Detect
	DEV	:Deviation
	DHP	:Double High Pass
	DIGITRON	:Digital Display Tube
	DL	:Delay Line
	DOC	:Drop Out Compensator
	DUB	:Dubbing
	D.V SYNC	:Dummy Vertical Synchronization
E	E	:Emitter
	EE	:Electric to Electric
	EMPH	:Emphasis
	ENA	:Enable
	ENV	:Envelope
	EP	:Extended Play
	EQ	:Equalizer
	EXP	:Expander
F	F	:Fuse
	FB	:Feed Back
	FBC	:Feed Back Clamp
	FE	:Full Erase
	FG	:Frequency Generator
	FL	:Filter
	FM	:Frequency Modulation
	F/R	:Forward/Reverse
	FS	:Frequency Synthesizer
	FSC	:Subcarrier Frequency
	F/V	:Frequency Voltage
G	GEN	:Generator
H	H	:High, Horizontal
I	IC	:Intergrated Circuit
	IF	:Intermediate Frequency
	INS	:Insert
L	L	:Low, Left, Coil
	LD	:Loading
	LD VTG CTL	:Loading Voltage Control
	LECHA	:Letter Character
	LM	:Level Meter
	LP	:Long Play
	LPF	:Low Pass Filter
M	MAX	:Maximum
	MD	:Modulator
	MECHA.CTL	:Mechanism Control
	MIC	:Microphone
	MIN	:Minimum
	MIX	:Mixer, Mixing
	M.M.	:Mono Multi Vibrator
	MMV	:Monostable Multivibrator
	MOD	:Modulation, Modulator
	MODEN	:Modulation-Demodulator
	MPX	:Multiplex
N	NR	:Noise Reduction
O	OSC	:Oscillator
	OSD	:On Screen Display
P	PB	:Playback
	PCB	:Printed Circuit Board
	P.CTL	:Power Control
	PER-AMP	:Preamplifier
	P.F	:Power Failure
	PG	:Pulse Generator
	PLL	:Phase Locked Loop
	PREM.DET	:Premire Detect
	P-P	:Peak to Peak
	PS	:Phase Shift
	PWM	:Pulse Width Modulation
	PWR CTL	:Power Control
Q	Q	:Transistor
	QH	:Quasi Horizontal
	QSR	:Quick Set Record
	QTR	:Quick Timer Record
	QV	:Quasi Vertical
R	R	:Resistor, Right
	RE(or RC)	:Remocon, Receiver
	REC	:Recording
	REC S.'H'	:Record Start 'Hight'
	REF	:Reference
	REG	:Regulated, Regulator
	REMOCON	:Remote Control(unit)
	RF	:Radio Frequency
	R/P	:Record/Playback
	RTC	:Real Time Counter
S	S	:Serial
	S.ACCEL	:Slow Accel
	SAOP	:Second Audio Program
	SC	:Scart, Simulcast
	S.DET	:Secam Detect
	SH	:Shift
	SHARP	:Sharpness
	SIF	:Sound Intermediate Frequency
	SLD	:Side Locking
	S/N	:Signal to Noise Ratio
	SP	:Standard Play
	ST	:Stereo
	SUB	:Subtract, Subcarrier
	SW or S/W	:Switch
	SYNC	:Synchronization
	SYSCON	:System Control
T	T	:Coil
	TP	:Test Point
	TR	:Transistor
	TRK	:Tracking
	TRANS	:Transformer
	TU	:Tuner, Take-Up
U	UHF	:Ultra Hight Frequency
	UNREG	:Unregulated
V	V	:Volte, Vertical, Video
	VA	:Voltage Alive
	VCO	:Voltage Controlled Oscillator
	VGC	:Voltage Gain Control
	VHF	:Very High Frequency
	V.H.SW	:Video Head Switch
	VISS	:VHS Index Search System
	VPS	:Video Program System
	VR	:Variable Resistor or Volume
	V-SYNC	:Vertical Synchronization
	VTG	:Voltage
	VV	:Video to Video
	VXO	:Voltage X-tal Oscillator
W	W	:Watt
	WHT	:White
	W/O	:With Out
X	X-TAL	:Crystal
Y	Y/C	:Luminance/Chrominance
	YNR	:Luminance Noise Reduction
Z	ZD	:Zener Diode

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, the products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

• Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Use Specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistor

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.(Fig. 1)

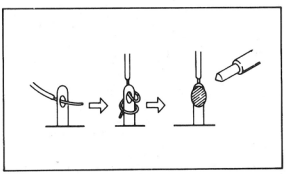


Fig. 1

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10-15Kg of force in any direction will not loosen it.(Fig. 2)

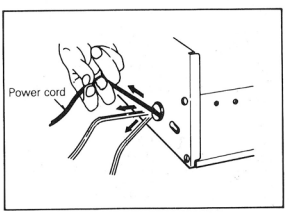


Fig. 2

9. Also check areas surrounding repaired locations.

10. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the parts specified. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

SAFETY CHECK AFTER SERVICING

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

• Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.

• Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table below.

• Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

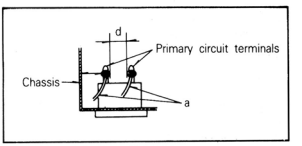


Fig. 3

Table 1:Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance(d),(d)
*110 to 130 V 200 to 240 V	Europe Australia	≧10 MΩ/500 V DC	4kV 1 minute	≧6mm(d) ≧8mm(d) (a Power cord)

*Class II model only.

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

• Leakage Current test

Confirm specified or lower leakage current between B(earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.)

Measuring Method: (Power ON)
Insert load Z between B(earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

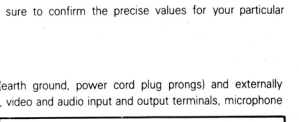


Fig. 4

Table 2:Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current(i)	Earth Ground (B) to:
100 to 130 V	Europe	2kΩ	i≦0.7m A peak i≦2m A dc	Antenna earth terminals
200 to 240 V	Australia	50kΩ	i≦0.7m A peak i≦2m A dc	Other terminals

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

SECTION2 CABINET & MAIN FRAME
SERVICE METHOD

1. Electrical Part

(1) Disassembly Flow

Top Case

Bottom Cover

Front Panel

Housing & Deck Assembly

Main C.B.A

Display C.B.A

(2) Re-assembly Flow for service like Fig.2-1

Display C.B.A

Main C.B.A

Housing & Deck Assembly

(3) To check and replace Electrical parts
- ①. Disassemble the unit according to No.1) Disassembly Flow.
- ②. Re-assemble the unit according to No.2) Re-assemble Flow.
- ③. Place the unit like Fig. 2-1.
- ④. Check and replace Electrical parts.

Note:
- ①. Insert Video Cassette Tape inversely like Fig. 2-1 to check and replace defective parts.
- ②. In disassembling and reassembling, be careful not to damaged CST switch.

(Positioned Upside Down)

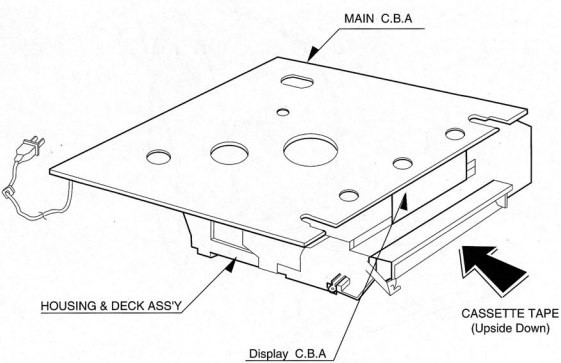
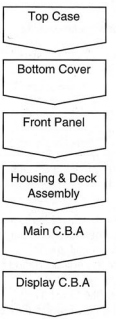


Fig. 2-1

2. Mechanical Part

(1) Disassembly Flow



(2) To check and replace Mechanical parts

① Disassemble the unit according to No.1) Disassembly Flow.

② Connect Service Extension Fixtures 4EA (EXT.① ~ ④) and Mechanism Tables 4EA (EXT. ⑤) like Fig. 2-2.

③ Prevent the operation of Supply and T-up End Sensor and Reel sensor (Short Diode D5E2 on Main C.B.A).

④ Insert Video Cassette Tape (Then push CST switch for a moment during inserting the Tape).

⑤ Check and replace mechanical parts.

⑥ Eject the Video Cassette Tape (Then push the CST switch like above No. ④).

⑦ Open the Diode mentioned above No. ③.

Note :

① Be sure to confirm above No. ⑦ (open D5E2). In disassembling and reassembling, be careful not to damaged CST switch.

※ The Green line of each EXT. must be connected with No. ① Pin of each connector.

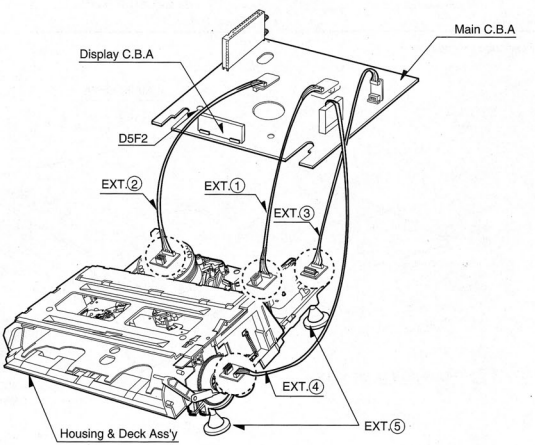
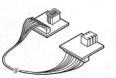
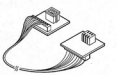
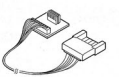
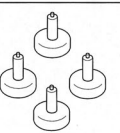
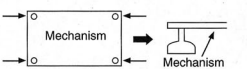


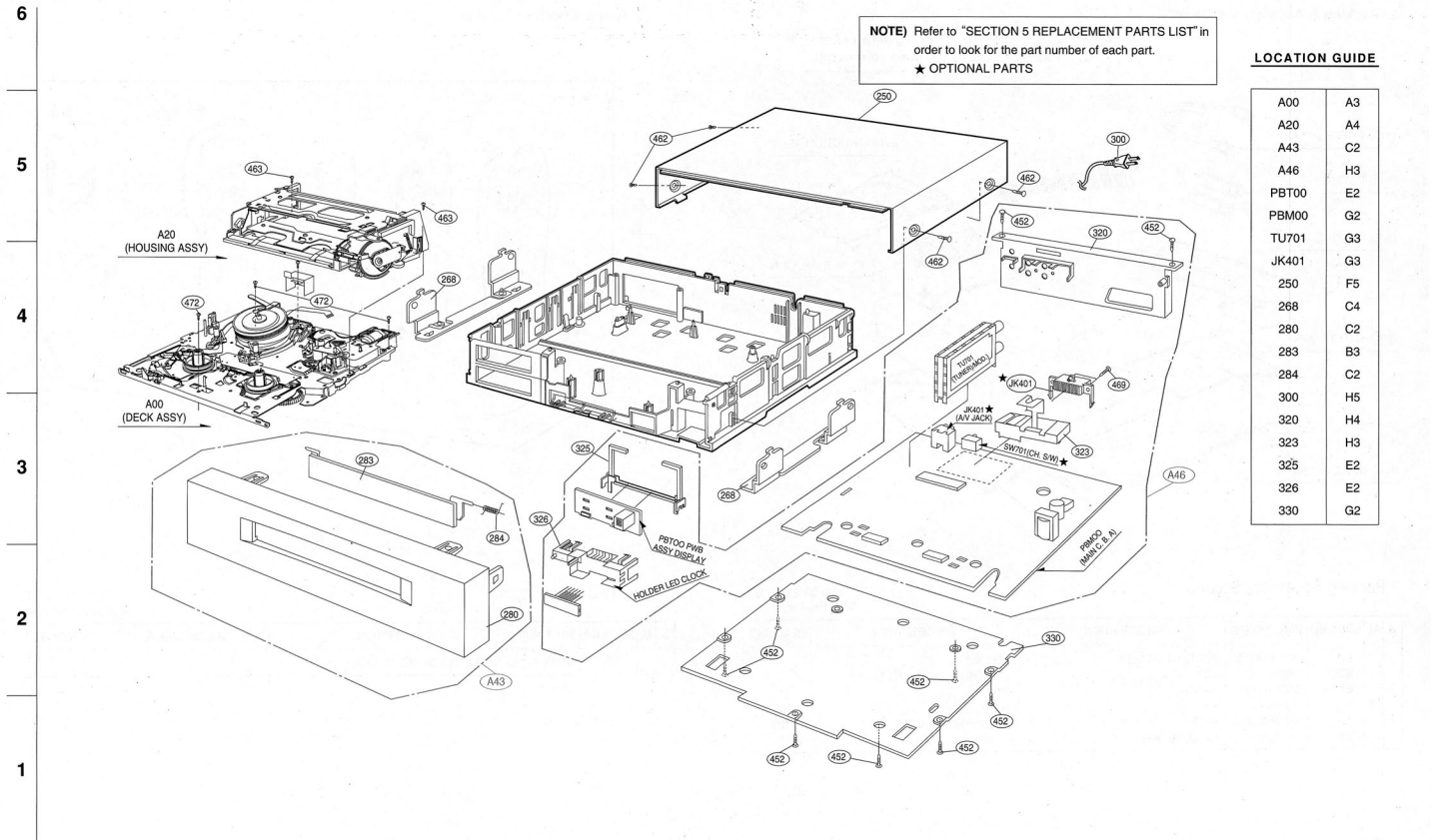
Fig.2-2

SERVICE ACCESSORIES

Fixture No.	Part No.	Illustration	Connection Information
EXT.① Capstan ↕ MAIN C.B.A	6871R-0288W		MAIN C.B.A (PMD02) — PD1 — P1; CAPSTAN — PD2 — P2
EXT.② DRUM ↕ MAIN C.B.A	6871R-0288B		MAIN C.B.A (PMD01) — PD1 — P3; DRUM — PD2 — P4
EXT.③ A/C Head ↕ MAIN C.B.A	6871R-0288D		MAIN C.B.A (PMD03) — P11 — P12; A/C Head
EXT.④ Mode Switch ↕ MAIN C.B.A	6871R-0288E		MAIN (PMD04) — P10; MODE SWITCH — PS1 — P9
EXT.⑤ Mechanism Table	322-065A		

EXPLODED VIEWS

1. Cabinet & Mainframe Section

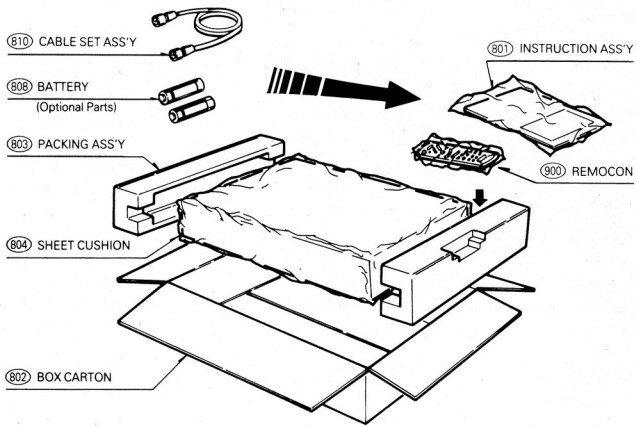

NOTE) Refer to "SECTION 5 REPLACEMENT PARTS LIST" in order to look for the part number of each part.
★ OPTIONAL PARTS
A20 (HOUSING ASSY)
A00 (DECK ASSY)
A43
A46
PBT00 PWB ASSY,DISPLAY
HOLDER LED CLOCK
TU701 (TUNER MOD.)
JK401★ (AV JACK)
SW701(CH. S/W)★
PBM00 (MAIN C.B. A)

LOCATION GUIDE

A00	A3
A20	A4
A43	C2
A46	H3
PBT00	E2
PBM00	G2
TU701	G3
JK401	G3
250	F5
268	C4
280	C2
283	B3
284	C2
300	H5
320	H4
323	H3
325	E2
326	E2
330	G2

2. Packing & Accessory Section

NOTE) Refer to "SECTION 5 REPLACEMENT PARTS LIST" in order to look for the part number of each part.

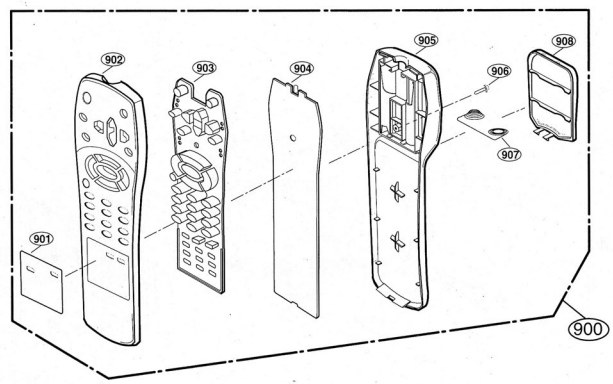


· Packing Accessory Section

RUN DATE : 98.08.22
NSP: Not Service Part

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		801	3835RP0029H	INSTRUCTION ASSY	C21Y 5HL1G	
		802	3890R-H101A	BOX	C21Y 5HL1G SW3-A 0.921 2 FLX 1	
		803	3920R-0052A	PACKING	C21P	
	OR	804	292-053A	BAG	SOFT(VCP)	NSP
		804	3858R-0006A	SHEET	ROLL(W630XL300MX0.5T)	NSP
		810	861-505B	CABLE SET ASSY	RF-CABLE,ASSY,PAL	

3. Remote Control Section

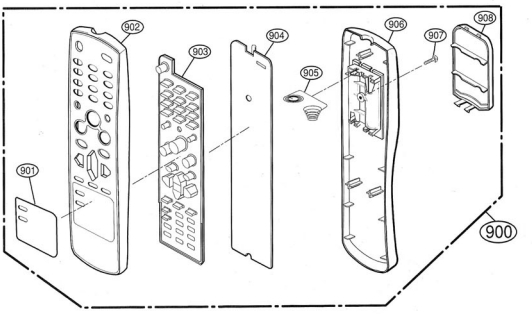


· Remote Control Section

RUN DATE : 98.08.22
NSP: Not Service Part

S	AL	LOCA.NO	PART NO(GS)	DESCRIPTION	SPECIFICATION	REMARKS
		900	6711R1P013U	REMOTE CONTROLLER ASSY	N1	

3. Remote Control Section



· Remote Control Section

SECTION3 ELECTRICAL

ELECTRICAL ADJUSTMENT PROCEDURES

Electronic Test Equipment

• Oscilloscope	• PAL Test Tape (SP)	• Power Supply
• Video Signal Generator	• Recording Tape	
• Level Meter	• Digital Multimeter	
• + Driver	• Monitor Scope	

ABBREVIATIONS

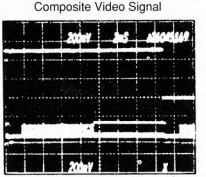
• SPEC: SPECIFICATION	• M.P: MEASUREMENT POINT	• A.P: Adjustment Point

1. Servo Circuit

1) PG Adjustment

WAVEFORM

Composite Video Signal



6.5H (416μsec)
(H.SW) W358/W359

- MODE : Playback
- SPEC : 6.5H ±0.5H (416μsec, 1H=64μsec)
- M.P : W358/W359 (H.SW) JK901 pin⑲(Video Out)
- A.P : VR501

Fig. 3-1

Purpose:

For the phase dividing of the Video A,B heads with 180° and the exact tracking of each track to meet head switching point with VHS Spec.

Procedure:

a. Playback a PAL SP test tape.
(At this time, the "ART" is lighting, after pressing the A.TR(+) or A.TR(-) and adjust the X-Value).

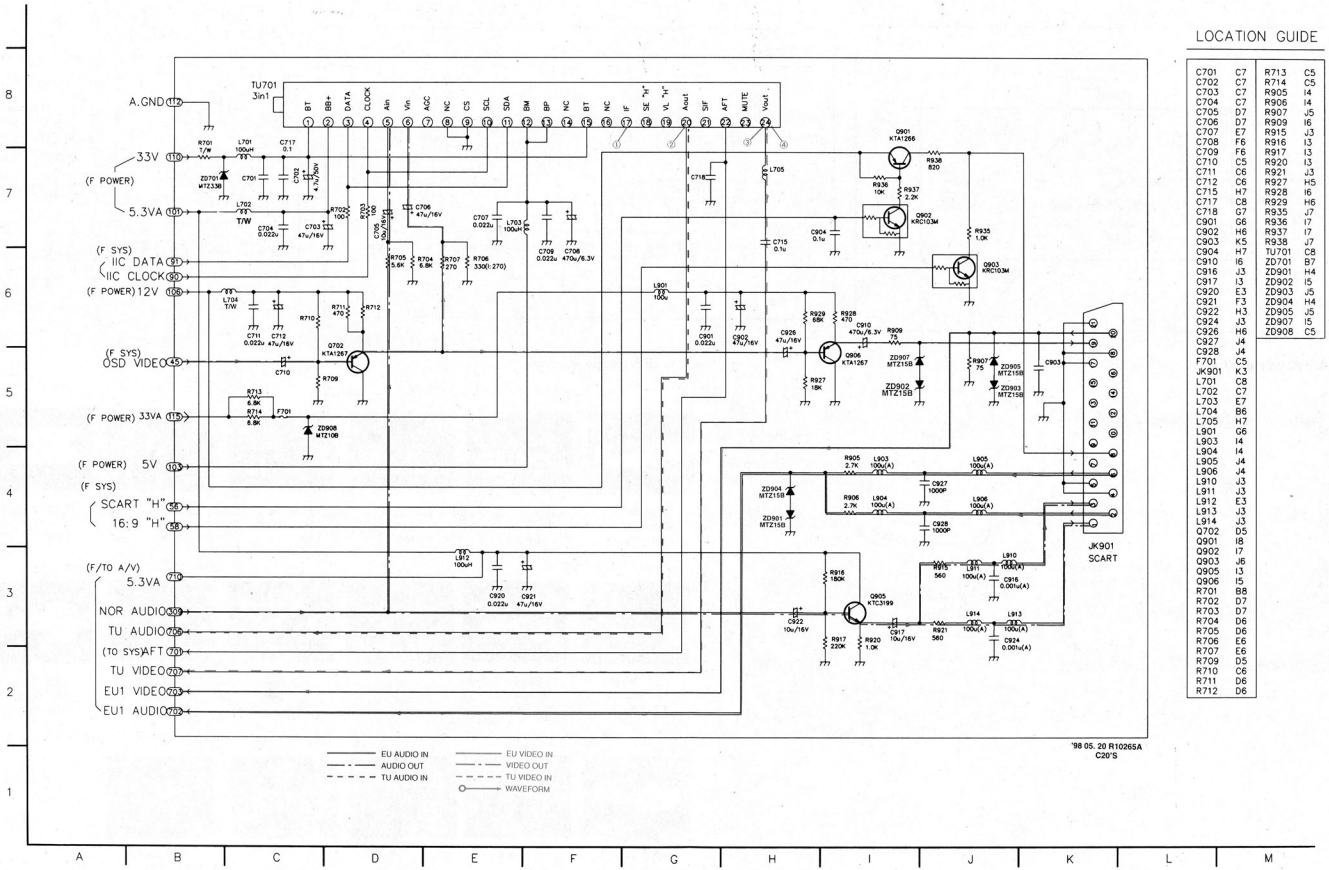
b. Connect CH-1 terminal of oscilloscope to W358/W359 (H.SW) and CH-2 terminal to Video Out terminal (JK901 pin⑲)of VCR.

c. Trigger the complex Video signal of CH2 to CH-1 (H.SW), and adjust VR501 so that the distance from A(B) head selection point of H.SW signal to the starting point of Vertical synchronized signal is 6.5H (416u sec, 1H=64μ sec).

Reference:

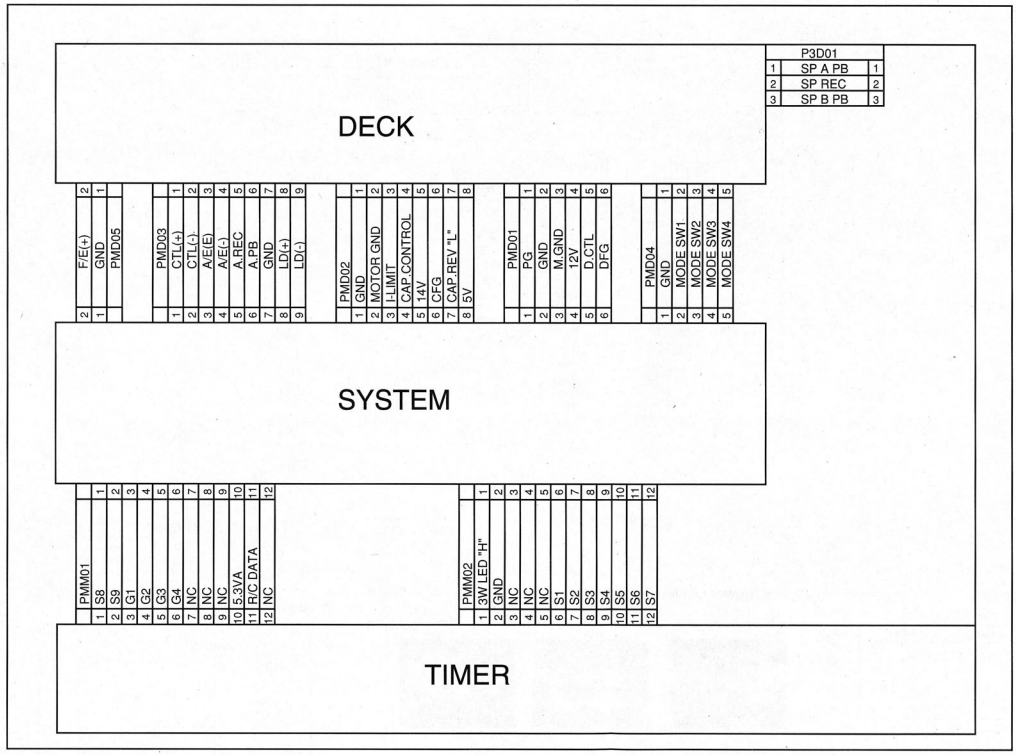
1. ±PG adjustment is practiced in the state of maximum RF level and locked servo system (MTR Mode).
2. The deviation between A/B Head Adjustment location should be within ±0.5H (32μ sec).
3. The deviation between the specification of adjustment and the practical measurement value should be within ±0.5H (32u sec).
4. Oscilloscope and VCR set should be connected with GND.

3. Tuner/IF, SCART Circuit Diagram

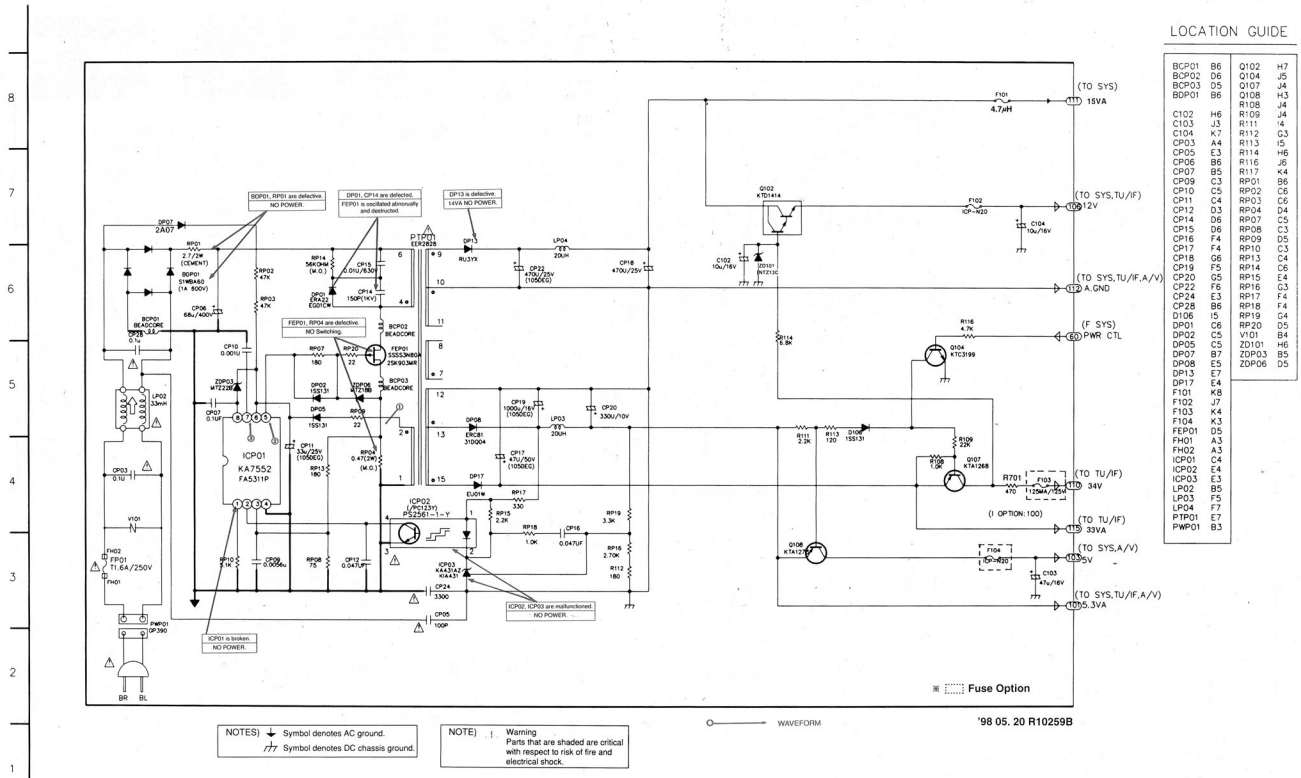


BLOCK & CIRCUIT DIAGRAMS

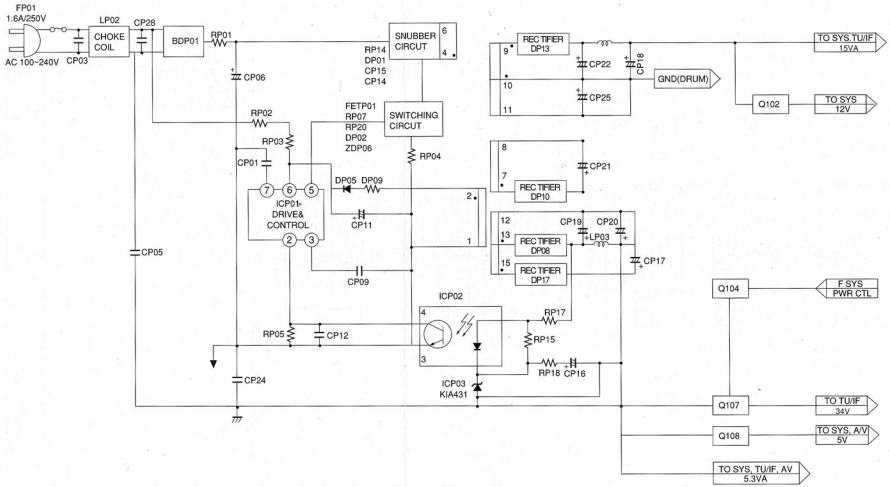
1. Overall Wiring Diagram



2. Power (SMPS) Circuit Diagram



2. Power (SMPS) Block Diagram

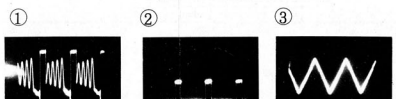


'98. 05. 20. R10259B

★ **Power TR Voltage sheet**

TR NO. \ Port	Emitter		Collector		Base	
	PB	REC	PB	REC	PB	REC
Q104	0.70	0.70	0.05	0.05	0	0.03
Q107	33.7	3.45	34.0	34.0	33.4	33.8
Q108	5.29	5.28	5.25	5.20	4.54	4.51

★ **Power Oscilloscope Waveform**

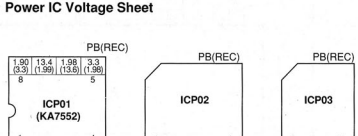


0.5V/div,5us/div

ICP01 Pin⑤
5V/div,50us/div

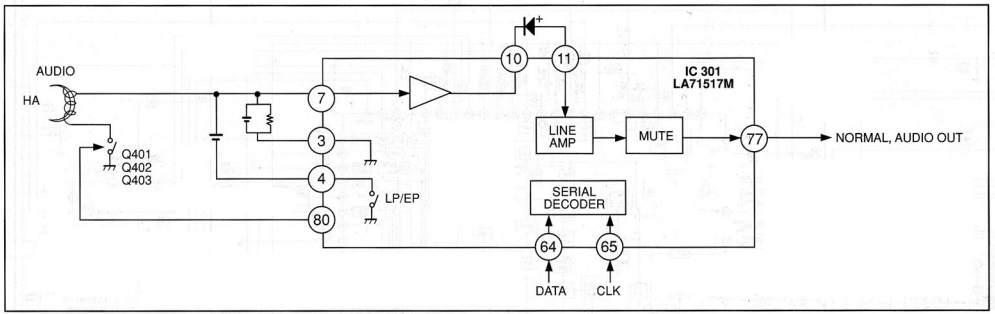
ICP01 Pin⑦
50V/div,50us/div

★ **Power IC Voltage Sheet**

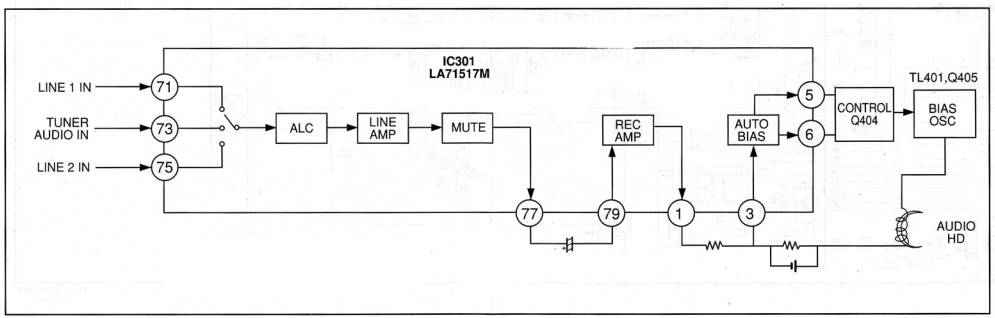


5. AUDIO Block Diagram

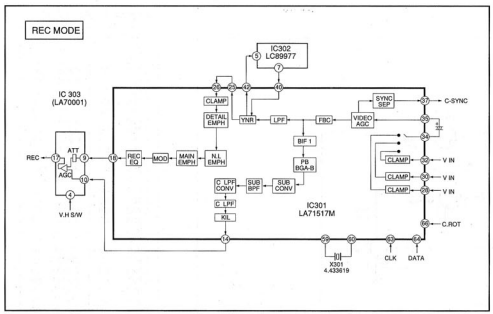
• **PB Mode**

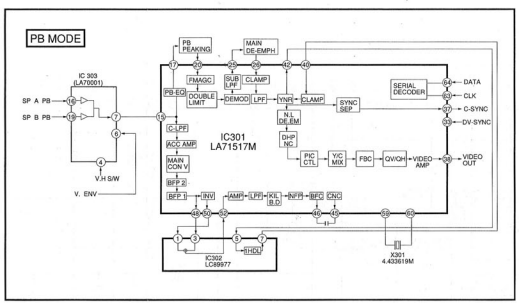


• **REC Mode**



4. Y/C Block Diagram



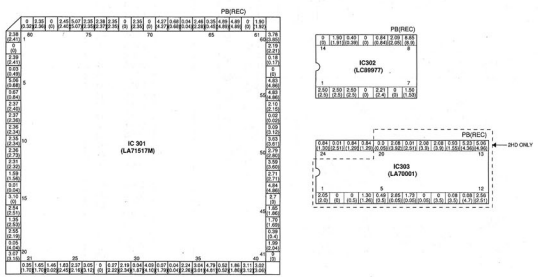


'98. 05. 20. R10260B

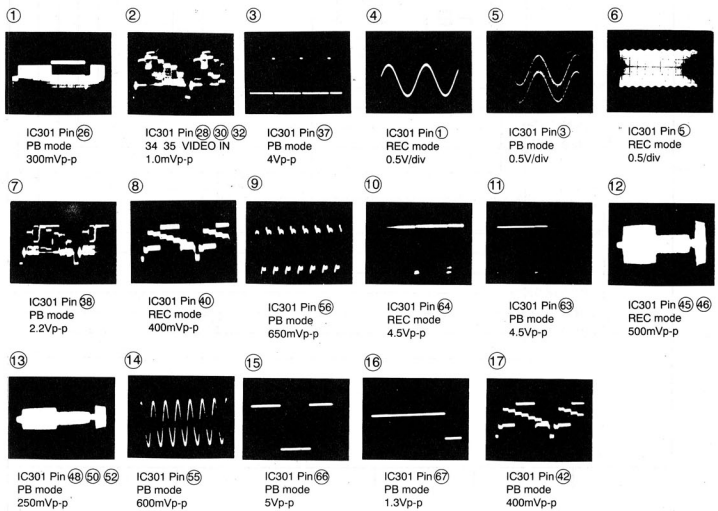
★ A/V TR voltage sheet

Port / TR NO.	Emitter		Collector		Base	
	PB	REC	PB	REC	PB	REC
Q301	0.74	1.89	4.06	2.94	1.35	2.53
Q302	0	0	0	0	0.63	0.63
Q303	1.77	1.56	4.79	4.81	2.37	2.16
Q309	2.15	2.16	0	0	1.50	1.52
Q401	3.96	4.64	4.56	-21.5	4.62	4.83
Q402	0	-15.84	0	0	0.7	-21.54
Q403	0	-15.86	0	0	0.69	-21.59
Q404	0	0	5.06	0.87	0	0.84
Q405	5.24	1.79	5.24	4.41	5.06	1.25
Q406	0.11	0.12	2.34	2.33	0	0

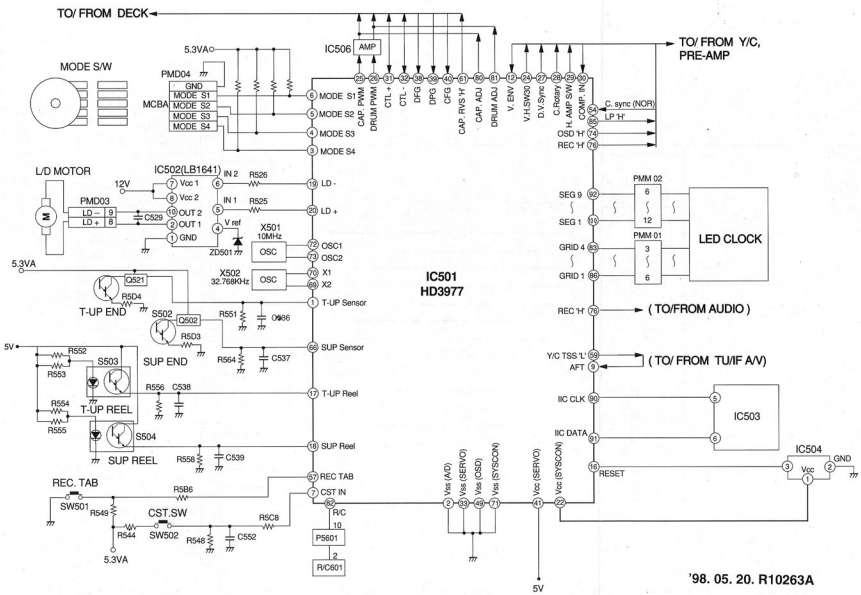
★ A/V IC voltage sheet



★ Y/C Oscilloscpe waveform



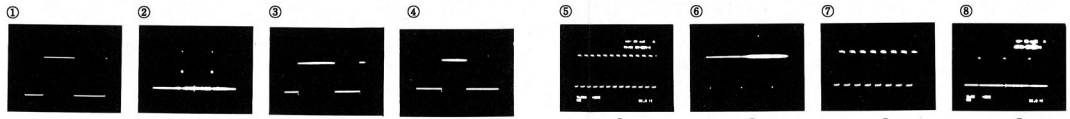
7. System Block Diagram



★ IC 501 voltage sheet

IC NO / MODE / PIN NO	IC501 PB	IC501 PB
1	0.16	0.21
2	0	0
3	5.266	5.266
4	0	0
5	5.266	5.266
7	0	0
8		
9	2.472	2.472
10	2.712	2.712
11	0	0
12	2.2	0.013
13	5.27	5.27
14	5.27	5.27
15	5.20	5.20
16	5.17	5.17
17	pulse	pulse
18	pulse	pulse
19	5.157	5.146
20	5.158	5.147
21	0	0
22	5.203	5.203
23	0	0
24	pulse	pulse
25	pulse	pulse
26	pulse	pulse
27	0	0.059
28	pulse	pulse
29	P/0	P/0
30	P/0	P/0
31	2.235	2.41
32	2.235	2.2
33	0	0
34	0	0.04
35	2.237	2.22
36	2.234	2.22
37	2.235	2.219
38	pulse	pulse
39	pulse	pulse
40	pulse	pulse
41	5.202	5.17
42	5.276	5.28
43		
44	1.423	1.423
45		
46	3.388	3.388
47	2.37	2.37
48	1.470	1.470
49	0	0
50		1.194

IC NO / MODE / PIN NO	IC501 PB	IC501 PB
51		1.13
52	2.483	2.483
53	2.43	2.43
54	0.544	0.544
55	0.009	0.004
56	pulse	pulse
57	0	5.265
58	pulse	pulse
59	0	0
60	5.053	5.053
61	5.142	5.131
62	0	0
63	0	0
64	5.154	5.144
65	5.154	5.154
66	0.169	0.054
67	0.004	3.1
68	0	0
69	1.312	1.312
70	0.788	0.788
71	0	0
72	2.419	2.405
73	2.438	2.47
74	pulse	pulse
75	0.019	pulse
76	0	5.135
77	5.096	5.096
78	3.115	3.096
79	5.098	5.098
80	2.77	2.77
81	1.215	1.228
82	5.02	5.02
83	0	0
84	5.152	5.152
85	pulse s165/0	pulse s165/0
86	0	0
87	4.219	4.219
88	0.01	0.01
89	4.176	4.176
90	pulse	pulse
91	pulse	pulse
92	0	0
93	0.01	0.01
94	pulse	pulse"
95	pulse	pulse
96	pulse	pulse
97	pulse	pulse
98	pulse	pulse
99	0	0
100	5.203	5.203



① IC501 Pin(24) 0.1V/5ms PB/REC

② IC501 Pin(27) 0.1V/5ms QUE/REC

③ IC501 Pin(31) 0.1V/5ms REC

④ IC501 Pin(32) 0.1V/5ms PB/REC

⑤ IC501 Pin(38) 0.1V/2ms PB/REC

⑥ IC501 Pin(39) 0.1V/10ms PB/REC

⑦ IC501 Pin(40) 0.1/1ms PB/REC

⑧ IC501 Pin(54) 0.1/20ms PB/REC